



SEQUENCE LISTING

<110> Hagen, Gustav
Siegmond, Hans-Ulrich
Weichel, Walter
Wick, Maresa
Zubov, Dmitry

<120> Human Catalytic Telomerase Sub-Unit and its Diagnostic and
Therapeutic Use

<130> Bayer 10,203

<140> US 09/424,686

<141> 1999-11-29

<150> PCT/EP98/03468

<151> 1998-06-09

<160> 12

<170> Microsoft Word

<210> 1

<211> 4042

<212> DNA

<213> Homo sapiens

<400> 1

gtttcaggca gcgctgcgtc ctgctgcgca cgtgggaagc cctggccccg gccacccccg 60
cgatgccgcg cgctccccgc tgccgagccg tgcgctccct gctgcgcagc cactaccgcg 120
aggtgctgcc gctggccacg ttcgtgcggc gcctggggcc ccagggctgg cggctggtgc 180
agcgcgggga cccggcggct ttccgcgcgc tgggtggccca gtgcctggtg tgcgtgcctt 240
gggacgcacg gccgcccccc gccgccccct ccttccgcca ggtgtcctgc ctgaaggagc 300
tgggtggccc agtgctgcag aggctgtgcg agcgcggcgc gaagaacgtg ctggccttcg 360
gcttcgcgct gctggacggg gcccgcgggg gccccccga ggccttcacc accagcgtgc 420
gcagctacct gcccaacacg gtgaccgacg cactgcgggg gagcggggcg tgggggctgc 480
tgctgcgccg cgtggggcgac gacgtgctgg ttcacctgct ggcacgctgc gcgctctttg 540
tgctggtggc tcccagctgc gcctaccagg tgtgcggggc gccgctgtac cagctcggcg 600
ctgccactca ggcccggccc ccgccacacg ctagtggacc ccgaaggcgt ctgggatgcg 660
aacgggcctg gaaccatagc gtcagggagg ccgggggtccc cctgggcctg ccagccccgg 720
gtgcgaggag gcgcgggggc agtgccagcc gaagtctgcc gttgccaag aggccaggc 780

RECEIVED
JUN 11 2003
TECH CENTER 1600/2900

gtggcgctgc ccctgagccg gagcggacgc ccgttgggca ggggtcctgg gccaccccg 840
 gcaggacgcg tggaccgagt gaccgtgggt tctgtgtggt gtcacctgcc agaccgccc 900
 aagaagccac ctctttggag ggtgcgctct ctggcacgcg ccactccac ccatccgtgg 960
 gccgccagca ccacgcgggc ccccatcca catcgcgcc accacgtccc tgggacacgc 1020
 cttgtcccc ggtgtacgc gagaccaagc acttcctcta ctctcaggc gacaaggagc 1080
 agctgcggcc ctcttccta ctacgtctc tgaggccag cctgactggc gctcggaggc 1140
 tcgtggagac catctttctg ggttccaggc cctggatgcc agggactccc cgcaggttgc 1200
 cccgctgcc ccagcgctac tggcaaatgc ggccctgtt tctggagctg cttgggaacc 1260
 acgcgcagtg cccctacggg gtgctcctca agacgcactg cccgctgcga gctgcggtca 1320
 cccagcagc cgggtgtctgt gcccgggaga agccccagg ctctgtggcg gccccgagg 1380
 aggaggacac agacccccgt cgcctgggtgc agctgctccg ccagcacagc agcccctggc 1440
 aggtgtacgg cttcgtgcgg gctgcctgc gccggctggt gccccaggc ctctggggct 1500
 ccaggcacia cgaacgcgc ttcctcagga acaccaagaa gttcatctcc ctggggaagc 1560
 atgccaagct ctgcgtgcag gagctgacgt ggaagatgag cgtgcgggac tgcgcttggc 1620
 tgcgcaggag cccaggggtt ggctgtgttc cggccgcaga gcaccgtctg cgtgaggaga 1680
 tcctggccaa gttcctgcac tggctgatga gtgtgtacgt cgtcgagctg ctacaggtctt 1740
 tcttttatgt cacggagacc acgtttcaaa agaacaggct ctttttctac cggaagagtg 1800
 tctggagcaa gttgcaaagc attggaatca gacagcactt gaagaggggtg cagctgcggg 1860
 agctgtcggg agcagaggtc aggcagcatc ggggaagccag gcccgccctg ctgacgtcca 1920
 gactccgctt catccccaag cctgacgggc tgcggccgat tgtgaacatg gactacgtcg 1980
 tgggagccag aacgttccgc agagaaaaga gggccgagcg tctcacctcg aggggtgaagg 2040
 cactgttcag cgtgctcaac tacgagcggg cgcggcgccc cggcctcctg ggcgcctctg 2100
 tgctgggcct ggacgatatc cacagggcct ggcgcacctt cgtgctgcgt gtgcgggccc 2160
 aggacccgcc gcctgagctg tactttgtca aggtggatgt gacgggcgcg tacgacacca 2220
 tccccagga caggctcacg gaggtcatcg ccagcatcat caaaccaccag aacacgtact 2280
 gcgtgcgtcg gtatgccgtg gtccagaagg ccgccatgg gcacgtccgc aaggccttca 2340
 agagccacgt ctctaccttg acagacctcc agccgtacat gcgacagttc gtggctcacc 2400
 tgcaggagac cagcccgtg agggatgccg tcgtcatcga gcagagctcc tccctgaatg 2460

aggccagcag tggcctcttc gacgtcttcc tacgcttcat gtgccaccac gccgtgcgca 2520
 tcaggggcaa gtccctacgtc cagtgccagg ggatcccgcg gggctccatc ctctccacgc 2580
 tgctctgcag cctgtgctac ggcgacatgg agaacaagct gtttgcgggg attcggcggg 2640
 acgggctgct cctgcgtttg gtggatgatt tcttggttgg gacacctcac ctcacccacg 2700
 cgaaaacctt cctcaggacc ctgggtccgag gtgtccctga gtatggctgc gtggtgaact 2760
 tgcggaagac agtgggtgaac ttccctgtag aagacgaggc cctgggtggc acggcttttg 2820
 ttcagatgcc ggcccacggc ctattcccct ggtgcggcct gctgctggat acccggaacc 2880
 tggaggtgca gagcgactac tccagctatg cccggacctc catcagagcc agtctcacct 2940
 tcaaccgcgg cttcaaggct gggaggaaca tgcgtcgcaa actctttggg gtcttgcggc 3000
 tgaagtgtca cagcctgttt ctggatttgc aggtgaacag cctccagacg gtgtgcacca 3060
 acatctacaa gatcctcctg ctgcaggcgt acaggtttca cgcgtgtgtg ctgcagctcc 3120
 catttcatca gcaagtttgg aagaaccca catttttccct gcgcgtcatc tctgacacgg 3180
 cctccctctg ctactccatc ctgaaagcca agaacgcagg gatgtcgctg ggggccaagg 3240
 gcgcgcggcg ccctctgccc tccgaggccg tgcagtggct gtgccaccaa gcattcctgc 3300
 tcaagctgac tcgacaccgt gtcacctacg tgccactcct ggggtcactc aggacagccc 3360
 agaocgagct gagtcggaag ctcccgggga cgacgctgac tgccctggag gccgcagcca 3420
 acccggcact gccctcagac ttcaagacca tcctggactg atggccaccc gccacagcc 3480
 aggccgagag cagacaccag cagccctgtc acgccgggct ctacgtccca gggagggagg 3540
 ggcggcccac acccaggccc gcaccgctgg gagtctgagg cctgagtgag tgtttggccg 3600
 aggctgcat gtccggctga aggctgagtg tccggctgag gcctgagcga gtgtccagcc 3660
 aagggtgag tgtccagcac acctgccgtc ttacttccc cacaggctgg cgctcggctc 3720
 caccacaggg ccagcttttc ctcaccagga gcccggttc cactccccac ataggaatag 3780
 tccatcccca gattcgccat tgttcacccc tcgcctgcc ctcttttgcc ttccaccccc 3840
 accatccagg tggagaccct gagaaggacc ctgggagctc tgggaatttg gagtgaccaa 3900
 aggtgtgccc tgtacacagg cgaggacct gcacctggat gggggtccct gtgggtcaaa 3960
 ttgggggggag gtgctgtggg agtaaaatac tgaatatatg agtttttcag ttttgaaaaa 4020
 aaaaaaaaaa aaaaaaaaaa aa 4042

<210> 2
 <211> 1132
 <212> PRT
 <213> Homo sapiens

<400> 2
 Met Pro Arg Ala Pro Arg Cys Arg Ala Val Arg Ser Leu Leu Arg Ser
 1 5 10 15
 His Tyr Arg Glu Val Leu Pro Leu Ala Thr Phe Val Arg Arg Leu Gly
 20 25 30
 Pro Gln Gly Trp Arg Leu Val Gln Arg Gly Asp Pro Ala Ala Phe Arg
 35 40 45
 Ala Leu Val Ala Gln Cys Leu Val Cys Val Pro Trp Asp Ala Arg Pro
 50 55 60
 Pro Pro Ala Ala Pro Ser Phe Arg Gln Val Ser Cys Leu Lys Glu Leu
 65 70 75 80
 Val Ala Arg Val Leu Gln Arg Leu Cys Glu Arg Gly Ala Lys Asn Val
 85 90 95
 Leu Ala Phe Gly Phe Ala Leu Leu Asp Gly Ala Arg Gly Gly Pro Pro
 100 105 110
 Glu Ala Phe Thr Thr Ser Val Arg Ser Tyr Leu Pro Asn Thr Val Thr
 115 120 125
 Asp Ala Leu Arg Gly Ser Gly Ala Trp Gly Leu Leu Leu Arg Arg Val
 130 135 140
 Gly Asp Asp Val Leu Val His Leu Leu Ala Arg Cys Ala Leu Phe Val
 145 150 155 160
 Leu Val Ala Pro Ser Cys Ala Tyr Gln Val Cys Gly Pro Pro Leu Tyr
 165 170 175
 Gln Leu Gly Ala Ala Thr Gln Ala Arg Pro Pro Pro His Ala Ser Gly
 180 185 190
 Pro Arg Arg Arg Leu Gly Cys Glu Arg Ala Trp Asn His Ser Val Arg
 195 200 205
 Glu Ala Gly Val Pro Leu Gly Leu Pro Ala Pro Gly Ala Arg Arg Arg
 210 215 220
 Gly Gly Ser Ala Ser Arg Ser Leu Pro Leu Pro Lys Arg Pro Arg Arg
 225 230 235 240
 Gly Ala Ala Pro Glu Pro Glu Arg Thr Pro Val Gly Gln Gly Ser Trp
 245 250 255
 Ala His Pro Gly Arg Thr Arg Gly Pro Ser Asp Arg Gly Phe Cys Val
 260 265 270

Val	Ser	Pro	Ala	Arg	Pro	Ala	Glu	Glu	Ala	Thr	Ser	Leu	Glu	Gly	Ala		
		275					280					285					
Leu	Ser	Gly	Thr	Arg	His	Ser	His	Pro	Ser	Val	Gly	Arg	Gln	His	His		
	290					295					300						
Ala	Gly	Pro	Pro	Ser	Thr	Ser	Arg	Pro	Pro	Arg	Pro	Trp	Asp	Thr	Pro		
305					310					315					320		
Cys	Pro	Pro	Val	Tyr	Ala	Glu	Thr	Lys	His	Phe	Leu	Tyr	Ser	Ser	Gly		
				325					330					335			
Asp	Lys	Glu	Gln	Leu	Arg	Pro	Ser	Phe	Leu	Leu	Ser	Ser	Leu	Arg	Pro		
			340					345					350				
Ser	Leu	Thr	Gly	Ala	Arg	Arg	Leu	Val	Glu	Thr	Ile	Phe	Leu	Gly	Ser		
		355					360					365					
Arg	Pro	Trp	Met	Pro	Gly	Thr	Pro	Arg	Arg	Leu	Pro	Arg	Leu	Pro	Gln		
	370					375					380						
Arg	Tyr	Trp	Gln	Met	Arg	Pro	Leu	Phe	Leu	Glu	Leu	Leu	Gly	Asn	His		
385					390					395				400			
Ala	Gln	Cys	Pro	Tyr	Gly	Val	Leu	Leu	Lys	Thr	His	Cys	Pro	Leu	Arg		
				405					410					415			
Ala	Ala	Val	Thr	Pro	Ala	Ala	Gly	Val	Cys	Ala	Arg	Glu	Lys	Pro	Gln		
			420					425					430				
Gly	Ser	Val	Ala	Ala	Pro	Glu	Glu	Glu	Asp	Thr	Asp	Pro	Arg	Arg	Leu		
		435					440					445					
Val	Gln	Leu	Leu	Arg	Gln	His	Ser	Ser	Pro	Trp	Gln	Val	Tyr	Gly	Phe		
	450					455					460						
Val	Arg	Ala	Cys	Leu	Arg	Arg	Leu	Val	Pro	Pro	Gly	Leu	Trp	Gly	Ser		
465					470					475					480		
Arg	His	Asn	Glu	Arg	Arg	Phe	Leu	Arg	Asn	Thr	Lys	Lys	Phe	Ile	Ser		
				485					490					495			
Leu	Gly	Lys	His	Ala	Lys	Leu	Ser	Leu	Gln	Glu	Leu	Thr	Trp	Lys	Met		
			500					505					510				
Ser	Val	Arg	Asp	Cys	Ala	Trp	Leu	Arg	Arg	Ser	Pro	Gly	Val	Gly	Cys		
		515					520					525					
Val	Pro	Ala	Ala	Glu	His	Arg	Leu	Arg	Glu	Glu	Ile	Leu	Ala	Lys	Phe		
	530					535					540						
Leu	His	Trp	Leu	Met	Ser	Val	Tyr	Val	Val	Glu	Leu	Leu	Arg	Ser	Phe		
545					550					555					560		
Phe	Tyr	Val	Thr	Glu	Thr	Thr	Phe	Gln	Lys	Asn	Arg	Leu	Phe	Phe	Tyr		
				565					570					575			

Arg Lys Ser Val Trp Ser Lys Leu Gln Ser Ile Gly Ile Arg Gln His
 580 585 590
 Leu Lys Arg Val Gln Leu Arg Glu Leu Ser Glu Ala Glu Val Arg Gln
 595 600 605
 His Arg Glu Ala Arg Pro Ala Leu Leu Thr Ser Arg Leu Arg Phe Ile
 610 615 620
 Pro Lys Pro Asp Gly Leu Arg Pro Ile Val Asn Met Asp Tyr Val Val
 625 630 635 640
 Gly Ala Arg Thr Phe Arg Arg Glu Lys Arg Ala Glu Arg Leu Thr Ser
 645 650 655
 Arg Val Lys Ala Leu Phe Ser Val Leu Asn Tyr Glu Arg Ala Arg Arg
 660 665 670
 Pro Gly Leu Leu Gly Ala Ser Val Leu Gly Leu Asp Asp Ile His Arg
 675 680 685
 Ala Trp Arg Thr Phe Val Leu Arg Val Arg Ala Gln Asp Pro Pro Pro
 690 695 700
 Glu Leu Tyr Phe Val Lys Val Asp Val Thr Gly Ala Tyr Asp Thr Ile
 705 710 715 720
 Pro Gln Asp Arg Leu Thr Glu Val Ile Ala Ser Ile Ile Lys Pro Gln
 725 730 735
 Asn Thr Tyr Cys Val Arg Arg Tyr Ala Val Val Gln Lys Ala Ala His
 740 745 750
 Gly His Val Arg Lys Ala Phe Lys Ser His Val Ser Thr Leu Thr Asp
 755 760 765
 Leu Gln Pro Tyr Met Arg Gln Phe Val Ala His Leu Gln Glu Thr Ser
 770 775 780
 Pro Leu Arg Asp Ala Val Val Ile Glu Gln Ser Ser Ser Leu Asn Glu
 785 790 795 800
 Ala Ser Ser Gly Leu Phe Asp Val Phe Leu Arg Phe Met Cys His His
 805 810 815
 Ala Val Arg Ile Arg Gly Lys Ser Tyr Val Gln Cys Gln Gly Ile Pro
 820 825 830
 Gln Gly Ser Ile Leu Ser Thr Leu Leu Cys Ser Leu Cys Tyr Gly Asp
 835 840 845
 Met Glu Asn Lys Leu Phe Ala Gly Ile Arg Arg Asp Gly Leu Leu Leu
 850 855 860
 Arg Leu Val Asp Asp Phe Leu Leu Val Thr Pro His Leu Thr His Ala
 865 870 875 880

Lys Thr Phe Leu Arg Thr Leu Val Arg Gly Val Pro Glu Tyr Gly Cys
 885 890 895
 Val Val Asn Leu Arg Lys Thr Val Val Asn Phe Pro Val Glu Asp Glu
 900 905 910
 Ala Leu Gly Gly Thr Ala Phe Val Gln Met Pro Ala His Gly Leu Phe
 915 920 925
 Pro Trp Cys Gly Leu Leu Leu Asp Thr Arg Thr Leu Glu Val Gln Ser
 930 935 940
 Asp Tyr Ser Ser Tyr Ala Arg Thr Ser Ile Arg Ala Ser Leu Thr Phe
 945 950 955 960
 Asn Arg Gly Phe Lys Ala Gly Arg Asn Met Arg Arg Lys Leu Phe Gly
 965 970 975
 Val Leu Arg Leu Lys Cys His Ser Leu Phe Leu Asp Leu Gln Val Asn
 980 985 990
 Ser Leu Gln Thr Val Cys Thr Asn Ile Tyr Lys Ile Leu Leu Leu Gln
 995 1000 1005
 Ala Tyr Arg Phe His Ala Cys Val Leu Gln Leu Pro Phe His Gln Gln
 1010 1015 1020
 Val Trp Lys Asn Pro Thr Phe Phe Leu Arg Val Ile Ser Asp Thr Ala
 1025 1030 1035 1040
 Ser Leu Cys Tyr Ser Ile Leu Lys Ala Lys Asn Ala Gly Met Ser Leu
 1045 1050 1055
 Gly Ala Lys Gly Ala Ala Gly Pro Leu Pro Ser Glu Ala Val Gln Trp
 1060 1065 1070
 Leu Cys His Gln Ala Phe Leu Leu Lys Leu Thr Arg His Arg Val Thr
 1075 1080 1085
 Tyr Val Pro Leu Leu Gly Ser Leu Arg Thr Ala Gln Thr Gln Leu Ser
 1090 1095 1100
 Arg Lys Leu Pro Gly Thr Thr Leu Thr Ala Leu Glu Ala Ala Ala Asn
 1105 1110 1115 1120
 Pro Ala Leu Pro Ser Asp Phe Lys Thr Ile Leu Asp
 1125 1130

<210> 3
 <211> 1153
 <212> DNA
 <213> Homo sapiens

<400> 3
 gtgcctgcag agaccgtct ggtgcactct gattctccac ttgcctgttg catgtcctcg 60
 ttcccttggt tctcaccacc tcttgggttg ccatgtgcgt ttctgccga gtgtgtgttg 120

atcctctcgt tgcctcctgg tcaactgggca tttgctttta tttctctttg cttagtgtta 180
 cccctgatac tttttattgt cgttgtttgc ttttgtttat tgagacagtc tcaactctgtc 240
 acccaggctg gagtgtaatg gcacaatctc ggctcactgc aacctctgcc tcctcggttc 300
 aagcagttct cattcctcaa cctcatgagt agctgggatt acaggcgccc accaccacgc 360
 ctggctaatt tttgtatttt tagtagagat aggctttcac catgttggcc aggctggtct 420
 caaactcctg acctcaagtg atctgcccgc cttggcctcc cacagtgtctg ggattacagg 480
 tgcaagccac cgtgcccggc ataccttgat cttttaaaat gaagtctgaa acattgctac 540
 ccttgtcctg agcaataaga cccttagtgt attttagctc tggccacccc ccagcctgtg 600
 tgctgttttc cctgctgact tagttctatc tcaggcatct tgacaccccc acaagctaag 660
 cattattaat attgttttcc gtgttgagtg tttcttttagc tttgcccccg cctgctttt 720
 cctcctttgt tccccgtctg tcttctgtct caggccccgc gtctggggtc cccttccttg 780
 tcctttgcgt ggttcttctg tcttgttatt gctggtaaac ccagcttta cctgtgctgg 840
 cctccatggc atctagcgac gtccggggac ctctgcttat gatgcacaga tgaagatgtg 900
 gagactcacg aggagggcgg tcactcttggc ccgtgagtgt ctggagcacc acgtggccag 960
 cgttccttag ccagggttgg ctgtgttccg gccgcagagc accgtctgcg tgaggagatc 1020
 ctggccaagt tcctgcactg gctgatgagt gtgtacgtcg tcgagctgct caggtctttc 1080
 ttttatgtca cggagaccac gtttcaaaag aacaggctct ttttctaccg gaagagtgtc 1140
 tggagcaagt tgc 1153

<210> 4
 <211> 412
 <212> DNA
 <213> Homo sapiens

<400> 4
 cagagccctg gtcctcctgt ctccatcgtc acgtgggcac acgtggcttt tcgctcagga 60
 cgtcgagtgg acacggtgat ctctgcctct gctctccctc ctgtccagtt tgcataaact 120
 tacgaggttc accttcacgt tttgatggac acgcggtttc caggcaccga ggccagagca 180
 gtgaacagag gaggctgggc gcggcagtgg agccggggtt cgggcaatgg ggagaagtgt 240
 ctggaagcac agacgctctg gcgagggtgc ctgcagagac ccgcctggtg cactctgatt 300
 ctccacttgc ctgttgcatg tcctcgttcc cttgtttctc accacctctt gggttgccat 360

gtgcgtttcc tgccgagtgt gtgttgatcc tctcgttgcc tccctggtcac tg 412

<210> 5
<211> 1012
<212> DNA
<213> Homo sapiens

<400> 5
ggggtcctgg gccaccccg gcaggacgcg tggaccgagt gaccgtgggt tctgtgtggt 60
gtcacctgcc agaccgcgcg aagaagccac ctctttggag ggtgcgctct ctggcacgcg 120
ccactccac ccatccgtgg gccgccagca ccacgcgggc ccccatcca catcgcggcc 180
accacgtccc tgggacacgc cttgtcccc ggtgtacgcc gagaccaagc acttcctcta 240
ctcctcaggc gacaaggagc agctgcggcc ctcttctcta ctacgtctc tgaggcccag 300
cctgactggc gctcggaggc tcgtggagac catctttctg ggttccaggc cctggatgcc 360
agggactccc cgcagggtgc cccgcctgcc ccagcgctac tggcaaatgc ggcccctgtt 420
tctggagctg cttgggaacc acgcgcagtg cccctacggg gtgctcctca agacgcactg 480
cccgtgcga gctgcggtca cccagcagc cgggtgtctgt gcccgggaga agccccaggg 540
ctctgtggcg gccccgagg aggaggacac agacccccgt cgcttgggtgc agctgctccg 600
ccagcacagc agcccctggc aggtgtacgg ctctgtgcgg gcctgcctgc gccggctggt 660
gccccaggc ctctggggct ccaggcacia cgaacgcgc ttcctcagga acaccaagaa 720
gttcatctcc ctggggaagc atgccaagct ctgcgtgcag gagctgacgt ggaagatgag 780
cgtgcgggac tgcgcttggc tgcgcaggag cccagggtgag gaggtggtgg ccgtcgaggg 840
cccaggcccc agagctgaat gcagtagggg ctcaaaaaag ggggcaggca gagccctggt 900
cctcctgtct ccatcgtcac gtgggcacac gtggcttttc gctcaggacg tcgagtggac 960
acggatgatct ctgcctctgc tctccctcct gtccagtttg cataaactta cg 1012

<210> 6
<211> 3972
<212> DNA
<213> Homo sapiens

<400> 6
gaattcgcgg ccgcgtcgac gtttcaggca gcgctgcgtc ctgctgcgca cgtgggaagc 60
cctggccccg gccacccccg cgatgccgcg cgctccccgc tgccgagccg tgcgctccct 120
gctgcgcagc cactaccgcg aggtgctgcc gctggccacg ttcgtgcggc gcctggggcc 180
ccagggtggt cggtggtgc agcgcgggga cccggcggtt ttccgcgcgc tgggtggcca 240

gtgcctggtg tgcgtgccct gggacgcacg gccgcccccc gccgccccct ccttccgcca 300
 ggtgtcctgc ctgaaggagc tggtagcccg agtgctgcag aggctgtgcg agcgcgggcg 360
 gaagaacgtg ctggccttcg gcttcgcgct gctggacggg gcccgcgggg gccccccga 420
 ggcccttcacc accagcgtgc gcagctacct gcccaacacg gtgaccgacg cactgcgggg 480
 gagcgggggc tgggggctgc tgctgcgcgc cgtgggcgac gacgtgctgg ttcacctgct 540
 ggcacgctgc gcgtctcttg tgctggtggc tcccagctgc gcctaccagg tgtgcggggc 600
 gccgctgtac cagctcggcg ctgccactca ggcccggccc ccgccacacg ctagtggacc 660
 ccgaaggcgt ctgggatgcg aacgggcctg gaaccatagc gtcagggagg ccgggggtccc 720
 cctgggcctg ccagccccgg gtgcgaggag gcgcgggggc agtgccagcc gaagtctgcc 780
 gttgccaag agggccaggc gtggcgctgc ccctgagccg gagcggacgc ccgttgggca 840
 ggggtcctgg gccacccgg gcaggacgcg tggaccgagt gaccgtggtt tctgtgtggt 900
 gtcacctgcc agaccgcgcg aagaagccac ctctttggag ggtgcgctct ctggcacgcg 960
 ccactcccac ccatccgtgg gccgccagca ccacgcgggc ccccatcca catcgcggcc 1020
 accacgtccc tgggacacgc cttgtcccc ggtgtacgcc gagaccaagc acttcctcta 1080
 ctctcaggc gacaaggagc agctgcggcc ctcttcta ctcagctctc tgaggcccag 1140
 cctgactggc gctcggaggc tcgtggagac catctttctg gggtccaggc cctggatgcc 1200
 agggactccc cgcaggttgc ccgcctgcc ccagcgctac tggcaaagtc ggccctggt 1260
 tctggagctg cttgggaacc acgcgcagtg cccctacggg gtgctcctca agacgcactg 1320
 cccgctgcga gctgcggtca cccagcagc cgggtgtctgt gcccgggaga agccccagg 1380
 ctctgtggcg gccccgagg aggaggacac agacccccgt cgctggtgc agctgctccg 1440
 ccagcacagc agccctggc aggtgtacgg ctctgtgcg gcctgcctgc gccggctggt 1500
 gccccaggc ctctggggct ccaggcaca cgaacgcgc ttcctcagga acaccaagaa 1560
 gttcatctcc ctggggaagc atgccaagct ctgcgtgcag gagctgacgt ggaagatgag 1620
 cgtgcgggac tgcgcttggc tgcgcaggag cccagggtgag gaggtggtgg ccgtcgagg 1680
 cccaggcccc agagctgaat gcagtagggg ctcagaaaag ggggcaggca gagccctggt 1740
 cctcctgtct ccatcgtcac gtgggcacac gtggcttttc gtcaggacg tcgagtggac 1800
 acggtgatct ctgcctctgc tctccctcct gtccagtttg cataaactta cgaggttcac 1860
 cttcacgttt tgatggacac gcggtttcca ggcgccgagg ccagagcagt gaacagagga 1920

ggctgggcgc ggcagtggag ccgggttgcc ggcaatgggg agaagtgtct ggaagcacag 1980
 acgctctggc gagggcgctt gcaggggttg gctgtgttcc ggccgcagag caccgtctgc 2040
 gtgaggagat cctggccaag ttctgcact ggctgatgag tgtgtacgtc gtcgagctgc 2100
 tcaggtcttt cttttatgtc acggagacca cgtttcaaaa gaacaggctc tttttctacc 2160
 ggaagagtgt ctggagcaag ttgcaaagca ttggaatcag acagcacttg aagaggggtgc 2220
 agctgcggga gctgtcggaa gcagagggtca ggcagcatcg ggaagccagg cccgccctgc 2280
 tgacgtccag actccgcttc atccccaagc ctgacgggct gcggccgatt gtgaacatgg 2340
 actacgtcgt gggagccaga acgttccgca gagaaaagag ggtggctgtg ctttggttta 2400
 acttcctttt taaacagaag tgcgtttgag cccacattt ggtatcagct tagatgaagg 2460
 gcccgaggga ggggccacgg gacacagcca gggccatggc acggcgccaa cccatttgtg 2520
 cgcacgggtga ggtggccgag gtgccgggtgc ctccagaaaa gcagcgtggg ggtgtagggg 2580
 gagctcctgg ggcagggaca ggctctgagg accacaagaa gcagctgggc cagggcctgg 2640
 atgcagcacg gcccgagcgg gtggggggccc accacgccat tctgggtcaaa ggtgttgtag 2700
 tcgtaatagc cggcccaggc gctctgaacc ttcagagtct caaaagctgg gaccctcagg 2760
 gccaaatggg gccacacctt gtcttgaag aaatcatggt ccacttccag gttcgccggg 2820
 tccggttctt cctgctcagt ggggctacga ccacctagggt agttgctacc taatccttcc 2880
 cggcgaaaat aggctccact ggtgtctgca acaagcggag tctctaggcc tggtccttgg 2940
 gggcagtgcc acacatacac ataccttttc ctgggtcca caggtagctt ggtgccctgc 3000
 agggtgccag gcggcccctc tccaacacca gccagtgtgt cgatttgccg agaccaggct 3060
 ccggctgcgt tgatcacaat ggcgcattcc acaggctgggt actccaggct gcgggccatc 3120
 ttcacatgga cttcatggat ctttttcaag accaccgctt tgtcatctgt ggtcaacatg 3180
 cgttgagatg aagagacaaa acgtgtcacc tctccctggc agaaaaggac tccaaggac 3240
 tggacctttc gccgaagccc ctggagcaga caccaggggt caaaccaacc ttcgtcctcc 3300
 atcccataag acgccaagc cactccctct gtgtttatcc agggaaactt gttccgaagc 3360
 tgatcaggag acatcagaga aactttggct ccctcctgcc tctgcacttt cacgttgctc 3420
 tccatggctg cagcatcctt ttctgaagcc agcaagaggt agcccgaggg gttgaaccgg 3480
 aggtccaggg gaggagcatc gactacggcc aggtactcat tgatgttccg tagaaagctg 3540
 gctgaaaaga gggagagctg gatgttctca ggcaatgaga actgctgaca aatcccacct 3600
 actgagagcc cagtggaggc ctgtgaatac gtgtgggtccc gttccaccac tagcactcga 3660

atagcacctc gtctgctctc cagcttcttc agccaatagg ccacagacaa gccaagcacc 3720
 ccacctccca cgatcaccac atccgagtgc tcgggaggca ggtggctggt gtcttgcaagt 3780
 agatcacagg accttccagg caggatcgac ttgatcttct tcttaatctc agacaccttt 3840
 ccatcccagt ccagagaaaa gcctcctctg cgcgtgcctg gcctccgggt caagaggccc 3900
 cggcccatgc cgtgcggcag aacctccga atcatagccc ctctgagccc gggtcgacgc 3960
 ggccgcgaat tc 3972

<210> 7
 <211> 2089
 <212> DNA
 <213> Homo sapiens

<400> 7
 ccggaagagt gtctggagca agttgcaaag cattggaatc agacagcact tgaagaggggt 60
 gcagctgcgg gagctgtcgg aagcagaggt caggcagcat cgggaagcca ggcccgccct 120
 gctgacgtcc agactccgct tcatcccca gctgacggg ctgcggccga ttgtgaacat 180
 ggactacgtc gtgggagcca gaacgttccg cagagaaaag agggccgagc gtctcacctc 240
 gaggggtgaag gcaactgttca gcgtgctcaa ctacgagcgg gcgcggcgcc ccggcctcct 300
 gggcgctctt gtgctggggc tggacgatat ccacagggcc tggcgcacct tcgtgctgcg 360
 tgtgcggggc caggaccgcg cgctgagct gtactttgtc aagggtgatg tgacggggcg 420
 gtacgacacc atccccagg acaggctcac ggaggtcatc gccagcatca tcaaacccca 480
 gaacacgtac tgcgtgcgtc ggtatgccgt ggtccagaag gccgcccatt ggacgtccg 540
 caaggccttc aagagccacg tctctacctt gacagacctc cagccgtaca tgcgacagtt 600
 cgtgggtcac ctgcaggaga ccagcccgtt gaggggtgcc gtcgtcatcg agcagagctc 660
 ctccctgaat gaggccagca gtggcctctt cgacgtcttc ctacgcttca tgtgccacca 720
 cgccgtgcgc atcaggggca agtcctacgt ccagtgccag gggatcccgc agggctccat 780
 cctctccaag ctgctctgca gcctgtgcta cggcgacatg gagaacaagc tgtttgcggg 840
 gattcggcgg gacgggctgc tcctgcgttt ggtggatgat ttcttggttg tgacacctca 900
 cctcaccac gcgaaaacct tcctcaggac cctggtcoga ggtgtccctg agtatggctg 960
 cgtggtgaac ttgcggaaga cagtggtgaa cttccctgta gaagacgagg ccctgggtgg 1020
 cacggctttt gttcagatgc cggccacgg cctattcccc tggcgggc tgctgctgga 1080
 taccggacc ctggaggtgc agagcgacta ctccagctat gcccgacct ccatcagagc 1140

cagtctcacc ttcaaccgcg gcttcaaggc tgggaggaac atgcgtcgca aactcttttg 1200
ggtcttgccg ctgaagtgtc acagcctgtt tctggatttg caggtgaaca gcctccagac 1260
ggtgtgcacc aacatctaca agatcctcct gctgcaggcg tacaggtttc acgcatgcgt 1320
gctgcagctc ccatttcacg agcaagtttg gaagaacccc acatttttcc tgcgcgtcat 1380
ctctgacacg gcctccctct gctactccat cctgaaagcc aagaacgcag gtatgtgcag 1440
gtgcctggcc tcagtggcag cagtgcctgc ctgctggtgt tagtgtgtca ggagactgag 1500
tgaatctggg cttaggaagt tcttaccctt ttccgcatca ggaagtgggt taaccaaac 1560
actgtcaggc tcgtctgccc gccctctcgt ggggtgagca gagcacctga tgggaaggac 1620
aggagctgtc tgggagctgc catccttccc accttgctct gcctggggaa gcgctggggg 1680
gcctggtctc tcctgtttgc cccatgggtg gatttggggg gcctggcctc tcctgtttgc 1740
cctgtggtgg gattgggctg tctcccgctc atggcactta gggcccttgt gcaaaccag 1800
gccaagggtc taggaggagg ccaggcccag gctacccac ccctctcagg agcagaggcc 1860
gcgtatcacc acgacagagc cccgcgcgt cctctgcttc ccagtcaccg tcctctgccc 1920
ctggacactt tgtccagcat caggaggtt tctgatccgt ctgaaattca agccatgtcg 1980
aacctgcggt cctgagctta acagcttcta ctttctgttc tttctgtgtt gtggagacc 2040
tgagaaggac cctgggagct ctgggaattt ggagtgaaca aaggtgtgc 2089

<210> 8

<211> 3860

<212> DNA

<213> Human

<220>

<221> CDS

<222> (1)..(3860)

<223> Nucleotides 2345 to 2526 of SEQ ID NO 1 were deleted to provide this sequence.

<400> 8

gtttcaggca gcgctgcgtc ctgctgcgca cgtgggaagc cctggccccg gccacccccg 60
cgatgccgcg cgctccccgc tgcgagccg tgcgtccct gctgcgcagc cactaccgcg 120
aggtgctgcc gctggccacg ttcgtgcggc gcctggggcc ccagggtctg cggtggtgc 180
agcgcgggga cccggcggtt ttccgcgcgc tggtagccca gtgcctggtg tgcgtgccct 240
gggacgcacg gccgcccccc gccgccccct ccttccgcca ggtgtcctgc ctgaaggagc 300

tggtggcccg agtgctgcag aggctgtgcg agcgcgggcg gaagaacgtg ctggccttcg	360
gcttcgcgct gctggacggg gcccgcgggg gccccccga ggccttcacc accagcgtgc	420
gcagctacct gcccaacacg gtgaccgacg cactgcgggg gagcggggcg tgggggctgc	480
tgctgcgccg cgtgggcgac gacgtgctgg ttcacctgct ggcacgctgc gcgctctttg	540
tgctggtggc tcccagctgc gcctaccagg tgtgcggggc gccgctgtac cagctcggcg	600
ctgccactca ggccccggcc ccgccacacg ctagtggacc ccgaaggcgt ctgggatgcg	660
aacgggcctg gaaccatagc gtcagggagg ccgggggtccc cctgggcctg ccagccccgg	720
gtgcgaggag gcgcgggggc agtgccagcc gaagtctgcc gttgcccaag agggccaggc	780
gtggcgctgc ccctgagccg gagcggacgc ccgttgggca ggggtcctgg gccacccgg	840
gcaggacgcg tggaccgagt gaccgtggtt tctgtgtggt gtcacctgcc agaccgcgcg	900
aagaagccac ctctttggag ggtgcgctct ctggcacgcg ccactccac ccatccgtgg	960
gccgccagca ccacgcgggc ccccatcca catcgcgggc accacgtccc tgggacacgc	1020
cttgtcccc ggtgtacgc gagaccaagc acttcctcta ctctcaggc gacaaggagc	1080
agctgcggcc ctcttctcta ctacgtctc tgaggcccag cctgactggc gctcggaggc	1140
tcgtggagac catctttctg ggttccaggc cctggatgcc agggactccc cgcaggttgc	1200
ccgcctgcc ccagcgctac tggcaaatgc ggccctgtt tctggagctg cttgggaacc	1260
acgcgcagtg cccctacggg gtgctcctca agacgcactg ccgctgcga gctgcggtca	1320
ccccagcagc cgggtgtctgt gcccgggaga agccccaggg ctctgtggcg gccccgagg	1380
aggaggacac agacccccgt cgcttgggtgc agctgctccg ccagcacagc agccctggc	1440
aggtgtacgg ctctgtgcgg gcctgcctgc gccggctggt gccccaggc ctctggggct	1500
ccaggcaca cgaacgccgc ttctcagga acaccaagaa gttcatctcc ctggggaagc	1560
atgccaaagt ctcgctgcag gagctgacgt ggaagatgag cgtgcgggac tgcgcttggc	1620
tgcgcaggag cccagggggt ggctgtgttc cggccgcaga gcaccgtctg cgtgaggaga	1680
tcctggccaa gttcctgcac tggtgatga gtgtgtacgt cgtcgagctg cttaggtctt	1740
tcttttatgt cacggagacc acgtttcaaa agaacaggct ctttttctac cggaagagtg	1800
tctggagcaa gttgcaaagc attggaatca gacagcactt gaagaggggtg cagctgcggg	1860
agctgtcggg agcagaggtc aggcagcatc ggggaagccag gcccgccctg ctgacgtcca	1920
gactccgctt catccccaa cctgacgggc tgcggccgat tgtgaacatg gactacgtcg	1980

tgggagccag aacgttccgc agagaaaaga gggccgagcg tctcacctcg aggggtgaagg	2040
cactgttcag cgtgctcaac tacgagcggg cgcggcgccc cggcctcctg ggcgcctctg	2100
tgctgggcct ggacgatatc cacagggcct ggcgcacctt cgtgctgcgt gtgcgggccc	2160
aggacccgcc gcctgagctg tactttgtca aggtggatgt gacgggcgcg tacgacacca	2220
tccccagga caggctcacg gaggtcatcg ccagcatcat caaaccacag aacacgtact	2280
gcgtgcgtcg gtatgccgtg gtccagaagg ccgcccatgg gcacgtccgc aaggccttca	2340
agaggcaagt cctacgtcca gtgccagggg atcccgagg gctccatcct ctccacgctg	2400
ctctgcagcc tgtgctacgg cgacatggag aacaagctgt ttgcggggat tcggcgggac	2460
gggctgctcc tgcgtttggg ggatgatttc ttgttggtga cacctcacct caccacgcg	2520
aaaaccttcc tcaggaccct ggtccgaggt gtccctgagt atggctgcgt ggtgaacttg	2580
cggaagacag tgggtgaactt ccctgtagaa gacgaggccc tgggtggcac ggcttttgtt	2640
cagatgccgg cccacggcct attcccctgg tgcggcctgc tgctggatac ccggaccctg	2700
gaggtgcaga gcgactactc cagctatgcc cggacctcca tcagagccag tctcaccttc	2760
aaccgcggct tcaaggctgg gaggaacatg cgtcgcaaac tctttggggg cttgcggctg	2820
aagtgtcaca gcctgtttct ggatttgcag gtgaacagcc tccagacggg gtgcaccaac	2880
atctacaaga tcctcctgct gcaggcgtac aggtttcacg catgtgtgct gcagctccca	2940
tttcatcagc aagtttggaa gaaccccaca tttttcctgc gcgtcatctc tgacacggcc	3000
tcctctgct actccatcct gaaagccaag aacgcaggga tgtcgctggg ggccaagggc	3060
gccgccggcc ctctgccctc cgaggccgtg cagtggctgt gccaccaagc attcctgctc	3120
aagctgactc gacaccgtgt cacctacgtg ccactcctgg ggtcactcag gacagcccag	3180
acgcagctga gtcggaagct cccggggacg acgctgactg ccctggaggc cgcagccaac	3240
ccggcactgc cctcagactt caagaccatc ctggactgat ggccaccgc ccacagccag	3300
gccgagagca gacaccagca gccctgtcac gccgggctct acgtcccagg gagggagggg	3360
cggcccacac ccaggcccg cccgctggga gtctgaggcc tgagtgagtg tttggccgag	3420
gcctgcatgt ccggctgaag gctgagtgtc cggctgaggc ctgagcgagt gtccagccaa	3480
gggctgagtg tccagcacac ctgccgtctt cacttcccca caggctggcg ctcggtcca	3540
ccccagggcc agcttttctt caccaggagc ccggcttcca ctccccacat aggaatagt	3600
catccccaga ttgccattg ttcaccctc gccctgcctt cctttgcctt ccacccccac	3660

catccaggtg gagaccctga gaaggaccct gggagctctg ggaatttgga gtgaccaaag	3720
gtgtgccctg tacacaggcg aggaccctgc acctggatgg gggccctgt gggtaaatt	3780
ggggggaggt gctgtgggag taaaatactg aatatatgag tttttcagtt ttgaaaaaaa	3840
aaaaaaaaa aaaaaaaaaa	3860

<210> 9

<211> 4006

<212> DNA

<213> Human

<220>

<221> CDS

<222> (1)..(4006)

<223> Nucleotides 2184 to 2219 of SEQ ID NO. 1 have been deleted to provide this sequence.

<400> 9

gtttcaggca gcgctgcgtc ctgctgcgca cgtgggaagc cctggccccg gccacccccg	60
cgatgccgcg cgtcccccgc tgccgagccg tgcgtccct gctgcgcagc cactaccgcg	120
aggtgctgcc gctggccacg ttcgtgcggc gcctggggcc ccagggtgg cggctggtgc	180
agcgcgggga cccggcggct ttccgcgcgc tgggtggcca gtgcctggtg tgcgtgccct	240
gggacgcacg gccgcccccc gccgccccct ccttccgcca ggtgtcctgc ctgaaggagc	300
tgggtggccc agtgctgcag aggctgtgcg agcgcgggcg gaagaacgtg ctggccttcg	360
gcttcgcgct gctggacggg gcccgcgggg gccccccga ggccttcacc accagcgtgc	420
gcagctacct gcccaacacg gtgaccgacg cactgcgggg gagcggggcg tgggggctgc	480
tgctgcgccc cgtgggagac gacgtgctgg ttcacctgct ggcacgctgc gcgctctttg	540
tgctggtggc tcccagctgc gcctaccagg tgtgcggggc gccgctgtac cagctcggcg	600
ctgccactca ggccccggcc ccgccacacg ctagtggacc ccgaaggcgt ctgggatgcg	660
aacgggcctg gaaccatagc gtcaggaggg ccgggggtccc cctgggcctg ccagccccgg	720
gtgcgaggag gcgcgggggc agtgccagcc gaagtctgcc gttgcccag agggccaggc	780
gtggcgctgc ccctgagccg gagcggacgc ccgttgggca ggggtcctgg gccacccccg	840
gcaggacgcg tggaccgagt gaccgtggtt tctgtgtggt gtcacctgcc agaccgccc	900
aagaagccac ctctttggag ggtgcgctct ctggcacgcg ccactcccac ccatccgtgg	960
gccgccagca ccacgcgggc cccccatcca catcgcggcc accacgtccc tgggacacgc	1020

cttgcccccc	ggtgtacgcc	gagaccaagc	acttcctcta	ctcctcaggc	gacaaggagc	1080
agctgcggcc	ctccttccta	ctcagctctc	tgaggcccag	cctgactggc	gctcggaggc	1140
tcgtggagac	catctttctg	ggttccaggc	cctggatgcc	agggactccc	cgcaggttgc	1200
cccgcctgcc	ccagcgctac	tggcaaatac	ggccccctgt	tctggagctg	cttgggaacc	1260
acgcgcagtg	cccctacggg	gtgctcctca	agacgcactg	cccgtgcga	gctgcggtca	1320
ccccagcagc	cgggtgtctgt	gcccgggaga	agccccaggg	ctctgtggcg	gcccccgagg	1380
aggaggacac	agacccccgt	cgcttgggtg	agctgctccg	ccagcacagc	agccccctggc	1440
aggtgtacgg	cttcgtgcgg	gcctgcctgc	gccggctggg	gccccagggc	ctctggggct	1500
ccaggcacia	cgaacgccgc	ttcctcagga	acaccaagaa	gttcatctcc	ctggggaagc	1560
atgccaaagt	ctcgctgcag	gagctgacgt	ggaagatgag	cgtgcgggac	tgcgcttggc	1620
tgcgccaggag	cccagggggt	ggctgtgttc	cggccgcaga	gcaccgtctg	cgtgaggaga	1680
tcctggccaa	gttcctgcac	tggtgatga	gtgtgtacgt	cgtcgagctg	ctcaggtctt	1740
tcttttatgt	cacggagacc	acgtttcaaa	agaacagggt	ctttttctac	cgggaagagt	1800
tctggagcaa	gttgcaaagc	attggaatca	gacagcactt	gaagagggtg	cagctgcggg	1860
agctgtcgga	agcagaggtc	aggcagcatc	gggaagccag	gcccgccttg	ctgacgtcca	1920
gactccgctt	catccccaag	cctgacgggc	tgccggccgat	tgtgaacatg	gactacgtcg	1980
tgggagccag	aacgttccgc	agagaaaaga	ggcccgagcg	tctcacctcg	agggtgaagg	2040
cactgttcag	cgtgctcaac	tacgagcggg	cgcggcgccc	cggcctcctg	ggcgccctctg	2100
tgctgggcct	ggacgatata	cacagggcct	ggcgcacctt	cgtgctgcgt	gtgcgggccc	2160
aggacccgcc	gcctgagctg	tacatcccc	aggacaggct	cacggaggtc	atcgccagca	2220
tcatcaaacc	ccagaacacg	tactgcgtgc	gtcggtatgc	cgtggtccag	aaggccgccc	2280
atgggcacgt	ccgcaaggcc	ttcaagagcc	acgtctctac	cttgacagac	ctccagccgt	2340
acatgcgaca	gttcgtggct	cacctgcagg	agaccagccc	gctgagggat	gccgtcgtca	2400
tcgagcagag	ctcctccctg	aatgaggcca	gcagtggcct	cttcgacgtc	ttcctacgct	2460
tcatgtgcca	ccacgccgtg	cgcatacagg	gcaagtccta	cgtccagtgc	caggggatcc	2520
cgcagggtc	catcctctcc	acgtgctct	gcagcctgtg	ctacggcgac	atggagaaca	2580
agctgtttgc	ggggattcgg	cgggacgggc	tgctcctgcg	tttgggtggat	gatttcttgt	2640
tggtgacacc	tcacctcacc	cacgcgaaaa	ccttcctcag	gacctgggtc	cgaggtgtcc	2700
ctgagtatgg	ctgcgtgggtg	aacttgcgga	agacagtggg	gaacttcctt	gtagaagacg	2760

```

aggccctggg tggcacggct tttgttcaga tgccggccca cggcctattc ccctggtgcg 2820
gcctgctgct ggatacccg accctggagg tgcagagcga ctactccagc tatgcccga 2880
cctccatcag agccagtctc accttcaacc gcggcttcaa ggctgggagg aacatgcgctc 2940
gcaaactctt tgggggtcttg cggtgaagt gtcacagcct gtttctggat ttgcaggtga 3000
acagcctcca gacggtgtgc accaacatct acaagatcct cctgctgcag gcgtacaggt 3060
ttcacgcatg tgtgctgcag ctcccatttc atcagcaagt ttggaagaac cccacatttt 3120
tcctgcgct catctctgac acggcctccc tctgtactc catcctgaaa gccaagaacg 3180
cagggatgtc gctggggggc aaggcgccg ccggccctct gccctccgag gccgtgcagt 3240
ggctgtgcca ccaagcattc ctgctcaagc tgactcgaca ccgtgtcacc tacgtgccac 3300
tcctggggtc actcaggaca gccagacgc agctgagtcg gaagctcccg gggacgacgc 3360
tgactgcct ggaggccgca gccaaaccgg cactgccctc agacttcaag accatcctgg 3420
actgatggc acccgccac agccaggccg agagcagaca ccagcagccc tgtcacgccg 3480
ggctctacgt cccaggagg gagggcgcc ccacaccag gcccgaccg ctgggagtct 3540
gaggcctgag tgagtgttg gccgaggcct gcatgtccg ctgaaggctg agtgtccggc 3600
tgaggcctga gcgagtgtcc agccaagggc tgagtgtcca gcacacctgc cgtcttcaact 3660
tccccacagg ctggcgctcg gctccacccc agggccagct tttcctcacc aggagcccgg 3720
cttccactcc ccacatagga atagtccatc cccagattcg ccattgttca cccctcgccc 3780
tgccctcctt tgccttccac cccaccatc caggtggaga ccctgagaag gaccctggga 3840
gctctgggaa tttggagtga ccaaagggtg gccctgtaca caggcgagga ccctgcacct 3900
ggatgggggt ccctgtgggt caaattgggg ggaggtgctg tgggagtaaa atactgaata 3960
tatgagtttt tcagttttga aaaaaaaaaa aaaaaaaaaa aaaaaa 4006

```

```

<210> 10
<211> 3824
<212> DNA
<213> Human

```

```

<220>
<221> CDS
<222> (1)..(3824)
<223> Nucleotides 2184 to 2219 and 2345 to 2526 of SEQ ID NO. 1 were de
      leted.

```

<400> 10

gtttcaggca gcgctgcgtc ctgctgcgca cgtgggaagc cctggccccg gccacccccg	60
cgatgccgcg cgctccccgc tgccgagccg tgcgctccct gctgcgcagc cactaccgcg	120
aggtgctgcc gctggccacg ttcgtgcggc gcctggggcc ccagggctgg cggctggtgc	180
agcgcgggga cccggcggtt ttccgcgcgc tggtagccca gtgcctggtg tgcgtgccct	240
gggacgcacg gccgcccccc gccgccccct ccttccgcca ggtgtcctgc ctgaaggagc	300
tggtagcccg agtgctgcag aggtgtgctg agcgcgggcg gaagaacgtg ctggccttcg	360
gcttcgcgct gctggacggg gcccgcgggg gccccccga ggccttcacc accagcgtgc	420
gcagctacct gcccaacacg gtgaccgacg cactgcgggg gagcggggcg tgggggctgc	480
tgctgcgccg cgtggggcgac gacgtgctgg ttcacctgct ggcacgctgc gcgctctttg	540
tgctggtggc tcccagctgc gcctaccagg tgtgcggggc gccgctgtac cagctcggcg	600
ctgccactca ggccccggcc ccgccacacg ctagtggacc ccgaaggcgt ctgggatgcg	660
aacgggcctg gaaccatagc gtcaggagag ccgggggtccc cctgggcctg ccagccccgg	720
gtgcgaggag gcgcgggggc agtgccagcc gaagtctgcc gttgcccagg agggccaggc	780
gtggcgctgc ccctgagccg gagcggacgc ccgttgggca ggggtcctgg gccaccccg	840
gcaggacgcg tggaccgagt gaccgtggtt tctgtgtggt gtcacctgcc agaccgcgcg	900
aagaagccac ctctttggag ggtgcgctct ctggcacgcg ccactcccac ccatccgtgg	960
gccgccagca ccacgcgggc ccccatcca catcgcgggc accacgtccc tgggacacgc	1020
cttgtcccc ggtgtacgcc gagaccaagc acttcctcta ctctcaggc gacaaggagc	1080
agctgcggcc ctcttccta ctacgtctc tgaggccag cctgactggc gctcggaggc	1140
tcgtggagac catctttctg ggttccaggc cctggatgcc agggactccc cgcagggtgc	1200
ccgcctgcc ccagcgctac tggcaaatgc ggcccctgtt tctggagctg cttgggaacc	1260
acgcgcagtg cccctacggg gtgctcctca agacgcactg cccgctgcga gctgcggtca	1320
ccccagcagc cgggtgtctgt gcccgggaga agccccagg ctctgtggcg gccccgagg	1380
aggaggacac agacccccgt cgcctggtgc agctgctccg ccagcacagc agcccctggc	1440
aggtgtacgg ctctgtgcgg gcctgcctgc gccggctggt gccccaggc ctctggggct	1500
ccaggcacia cgaacgcgcg ttctcagga acaccaagaa gttcatctcc ctggggaagc	1560
atgccaagct ctcgctgcag gagctgacgt ggaagatgag cgtgcgggac tgcgcttggc	1620
tgcgcaggag cccaggggtt ggctgtgttc cggccgcaga gcaccgtctg cgtgaggaga	1680

tcctggccaa gttcctgcac tggctgatga gtgtgtacgt cgtcgagctg ctcaggtctt	1740
tcttttatgt cacggagacc acgtttcaaa agaacaggct ctttttctac cggaagagtg	1800
tctggagcaa gttgcaaagc attggaatca gacagcactt gaagaggggtg cagctgcggg	1860
agctgtcggg agcagagggtc aggcagcatc ggggaagccag gcccgccttg ctgacgtcca	1920
gactccgctt catccccaag cctgacgggc tgcggccgat tgtgaacatg gactacgtcg	1980
tgggagccag aacgttccgc agagaaaaga gggccgagcg tctcacctcg aggggtgaagg	2040
cactgttcag cgtgctcaac tacgagcggg cgcggcgccc cggcctcctg ggcgcctctg	2100
tgctgggcct ggacgatatc cacagggcct ggcgcacctt cgtgctgctg gtgcgggccc	2160
aggacccgcc gcctgagctg tacatcccc aggacaggct cacggagggtc atcgccagca	2220
tcatacaacc ccagaacacg tactgcgtgc gtcggtatgc cgtggtccag aaggccgccc	2280
atgggcacgt ccgcaaggcc ttcaagaggc aagtcctacg tccagtcca ggggatcccc	2340
cagggtcca tcctctccac gctgctctgc agcctgtgct acggcgacat ggagaacaag	2400
ctgtttgcgg ggattcggcg ggacgggctg ctctgcgtt tgggtgatga tttcttggtg	2460
gtgacacctc acctaccca cgcgaaaacc ttctcagga ccctgggtccg aggtgtccct	2520
gagtatggct gcgtggtgaa cttgcggaag acagtgggtga acttcctgt agaagacgag	2580
gccctgggtg gcacggcttt tgttcagatg ccggcccacg gcctattccc ctggtgcggc	2640
ctgctgctgg ataccggac cctggagggtg cagagcgact actccagcta tgcccggacc	2700
tccatcagag ccagtctcac cttcaaccgc ggcttcaagg ctgggaggaa catgcgtcgc	2760
aaactctttg gggctcttgcg gctgaagtgt cacagcctgt ttctggattt gcagggtgaac	2820
agcctccaga cgggtgtgcac caacatctac aagatcctcc tgetgcaggc gtacaggttt	2880
cacgcatgtg tgetgcagct cccatttcat cagcaagttt ggaagaacct cacatttttc	2940
ctgcgcgtca tctctgacac ggctccctc tgetactcca tcctgaaagc caagaacgca	3000
gggatgtcgc tgggggccaa gggcgccgcc ggccctctgc cctccgaggc cgtgcagtgg	3060
ctgtgccacc aagcattcct gctcaagctg actcgacacc gtgtcaccta cgtgccactc	3120
ctggggtcac tcaggacagc ccagacgcag ctgagtcgga agctcccggg gacgacgctg	3180
actgccctgg aggccgcagc caaccggca ctgccctcag acttcaagac catcctggac	3240
tgatggccac ccgccacag ccaggccgag agcagacacc agcagccctg tcacgccggg	3300
ctctacgtcc cagggagggg ggggcggccc acaccaggc ccgcaccgct gggagtctga	3360
ggcctgagtg agtgtttggc cgaggcctgc atgtccggct gaaggctgag tgtccggctg	3420

```

aggcctgagc gagtgtccag ccaagggctg agtgtccagc acacctgccg tcttcacttc 3480
cccacaggct ggcgctcggc tccaccccag ggccagcttt tcctcaccag gagcccggct 3540
tccactcccc acataggaat agtccatccc cagattcgcc attgttcacc cctcgccctg 3600
ccctcctttg ccttccaccc ccaccatcca ggtggagacc ctgagaagga ccctgggagc 3660
tctgggaatt tggagtgacc aaaggtgtgc cctgtacaca ggagaggacc ctgcacctgg 3720
atgggggtcc ctgtgggtca aattgggggg aggtgctgtg ggagtaaaat actgaatata 3780
tgagtttttc agttttgaaa aaaaaaaaaa aaaaaaaaaa aaaa 3824

```

```

<210> 11
<211> 3411 OK
<212> DNA
<213> Human

```

```

<220>
<221> CDS
<222> (1)..(3411)
<223> Nucleotides 1-59 and 3471-4042 of SEQ ID NO 1 were deleted to provide this sequence.

```

```

<400> 11
gcgatgccgc gcgtccccg ctgccgagcc gtgcgctccc tgctgcgcag ccactaccgc 60
gaggtgctgc cgctggccac gttcgtgcgg cgccctggggc cccagggctg gcggtggtg 120
cagcgcgggg acccggcggc tttccgcgcg ctggtggccc agtgccctgt gtgcgtgcc 180
tgggacgcac ggccgcccc cgcgccccc tccttccgcc aggtgtcctg cctgaaggag 240
ctggtggccc gagtgtgca gaggctgtgc gagcgcgccg cgaagaacgt gctggccttc 300
ggcttcgcgc tgctggacgg ggcccgcggg ggcccccccg aggccttcac caccagcgtg 360
cgcagctacc tgcccaacac ggtgaccgac gcaactgcggg ggagcggggc gtgggggctg 420
ctgctgcgcc gcgtgggcga cgacgtgctg gttcacctgc tggcacgctg cgcgctcttt 480
gtgctggtgg ctcccagctg cgccctaccag gtgtgcgggc cgccgctgta ccagctcggc 540
gctgccactc aggcccggcc ccgcccacac gctagtggac cccgaaggcg tctgggatgc 600
gaacgggcct ggaaccatag cgtcaggag gcccgggtcc ccctgggcct gccagccccg 660
ggtgcgagga ggcgcggggg cagtgccagc cgaagtctgc cgttgcccaa gagggccagg 720
cgtggcgctg ccctgagcc ggagcggacg cccgttgggc aggggtcctg ggcccacccg 780
ggcaggacgc gtggaccgag tgaccgtggt ttctgtgtgg tgtcacctgc cagaccgcgc 840

```

gaagaagcca cctcttttga ggggtgcgctc tctggcacgc gccactccca cccatccgtg	900
ggccgccagc accacgcggg ccccccatcc acatcgcggc caccacgtcc ctgggacacg	960
ccttgteccc cggtgtacgc cgagaccaag cacttcctct actcctcagg cgacaaggag	1020
cagctgcggc cctccttctt actcagctct ctgaggccca gcctgactgg cgctcggagg	1080
ctcgtggaga ccatctttct gggttccagg ccctggatgc cagggactcc ccgcaggttg	1140
ccccgcctgc ccagcgcta ctggcaaata cgccccctgt ttctggagct gcttgggaac	1200
cacgcgcagt gccctacgg ggtgctcctc aagacgcact gcccgctgcg agctgcggtc	1260
accccagcag ccggtgtctg tgcccgggag aagccccagg gctctgtggc ggcccccgag	1320
gaggaggaca cagacccccg tcgcctgggtg cagctgctcc gccagcacag cagccccctg	1380
caggtgtacg gcttcgtgcg ggccctgcctg cgccggctgg tgccccagg cctctggggc	1440
tccaggcaca acgaacgccg cttcctcagg aacaccaaga agttcatctc cctggggaag	1500
catgccaagc tctcgctgca ggagctgacg tggaagatga gcgtgcggga ctgcgcttg	1560
ctgcgcagga gcccaggggt tggctgtgtt ccggccgcag agcaccgtct gcgtgaggag	1620
atcctggcca agttcctgca ctggctgatg agtgtgtacg tcgtcgagct gctcaggtct	1680
ttcttttatg tcacggagac cacgtttcaa aagaacaggc tctttttcta ccggaagagt	1740
gtctggagca agttgcaaag cattggaatc agacagcact tgaagagggg gcagctgcgg	1800
gagctgtcgg aagcagaggt caggcagcat cgggaagcca ggcccgccct gctgacgtcc	1860
agactccgct tcatccccaa gcctgacggg ctgcggccga ttgtgaacat ggactacgtc	1920
gtgggagcca gaacgttccg cagagaaaag agggccgagc gtctcacctc gaggggtgaag	1980
gcactgttca gcgtgctcaa ctacgagcgg gcgcggcgcc ccggcctcct gggcgctct	2040
gtgctggggc tggacgatat ccacagggcc tggcgcacct tcgtgctgcg tgtgcggggc	2100
caggacccgc cgcctgagct gtactttgtc aaggtggatg tgacggggcg gtacgacacc	2160
atcccccagg acaggctcac ggaggtcatc gccagcatca tcaaacccca gaacacgtac	2220
tgcgtgcgtc ggtatgccgt ggtccagaag gccgcccata ggcacgtccg caaggccttc	2280
aagagccacg tctctacctt gacagacctc cagccgtaca tgcgacagtt cgtggctcac	2340
ctgcaggaga ccagcccgt gagggatgcc gtcgtcatcg agcagagctc ctccctgaat	2400
gaggccagca gtggcctctt cgacgtcttc ctacgcttca tgtgccacca cgccgtgcgc	2460
atcaggggca agtcctacgt ccagtgccag gggatccgc agggctccat cctctccacg	2520

```

ctgctctgca gcctgtgcta cggcgacatg gagaacaagc tgtttgcggg gattcggcgg 2580
gacgggctgc tcttgcgttt ggtggatgat ttcttgttgg tgacacctca cctcaccac 2640
gcgaaaacct tcctcaggac cctggtcoga ggtgtccctg agtatggctg cgtgggtgaac 2700
ttgcggaaga cagtggtgaa cttccctgta gaagacgagg ccctgggtgg cacggctttt 2760
gttcagatgc cggcccaagg cctattcccc tgggtgcggc tgctgctgga taccggacc 2820
ctggaggtgc agagcgacta ctccagctat gcccgacct ccatcagagc cagtctcacc 2880
ttcaaccgcg gcttcaaggc tgggaggaac atgcgtcgca aactctttgg ggtcttgcgg 2940
ctgaagtgtc acagcctgtt tctggatttg caggtgaaca gcctccagac ggtgtgcacc 3000
aacatctaca agatcctcct gctgcaggcg tacaggtttc acgcatgtgt gctgcagctc 3060
ccatttcata agcaagtttg gaagaacccc acatttttcc tgcgcgtcat ctctgacacg 3120
gcctccctct gctactccat cctgaaagcc aagaacgcag ggatgtcgct gggggccaag 3180
ggcgccgccc gccctctgcc ctccgaggcc gtgcagtggc tgtgccacca agcattcctg 3240
ctcaagctga ctcgacaccg tgtcacctac gtgccactcc tggggtcact caggacagcc 3300
cagacgcagc tgagtcggaa gctcccgggg acgacgctga ctgccctgga ggccgcagcc 3360
aaccggcac tgcctcaga cttcaagacc atcctggact gatggccacc c 3411

```

```

<210> 12
<211> 4012
<212> DNA
<213> Homo sapien

```

```

<220>
<221> CDS
<222> (1)..(4042)
<223> Nucleotide positions 1-1782 and 3872 to 4042 are identical to the
      same sequences in SEQ ID NO: 1; nucleotide positions from 1783 t
      o 3871 are according to SEQ ID NO: 7.

```

```

<400> 12

```

```

gtttcaggca gcgctgcgtc ctgctgcgca cgtgggaagc cctggccccg gccacccccg 60
cgatgccgcg cgctccccgc tgccgagccg tgcgtccct gctgcgcagc cactaccgcg 120
aggtgctgcc gctggccacg ttctgtcggc gcctggggcc ccagggtgg cggtgggtgc 180
agcgcgggga cccggcggtt ttccgcgcgc tgggtggcca gtgcctggtg tgcgtgccct 240

```

gggacgcacg gccgcccccc gccgccccct ccttccgcca ggtgtcctgc ctgaaggagc	300
tgggtggccc agtgctgcag aggctgtgcg agcgcgggcg gaagaacgtg ctggccttcg	360
gcttcgcgct gctggacggg gcccgcgggg gcccccccga ggccttcacc accagcgtgc	420
gcagctacct gcccaacacg gtgaccgacg cactgcgggg gagcgggggcg tgggggctgc	480
tgctgcgccg cgtggggcgac gacgtgctgg ttcacctgct ggcacgctgc gcgctctttg	540
tgctggtggc tcccagctgc gcctaccagg tgtgcggggc gccgctgtac cagctcggcg	600
ctgccactca ggcccggccc ccgccacacg ctagtggacc ccgaaggcgt ctgggatgcg	660
aacgggcctg gaaccatagc gtcagggagg ccgggggtccc cctgggcctg ccagccccgg	720
gtgcgaggag gcgcgggggc agtgccagcc gaagtctgcc gttgcccagg agggccaggc	780
gtggcgctgc ccctgagccg gagcggacgc ccgttgggca ggggtcctgg gccaccccgg	840
gcaggacgcg tggaccgagt gaccgtgggt tctgtgtggt gtcacctgcc agaccgcgcg	900
aagaagccac ctctttggag ggtgcgctct ctggcacgcg ccactcccac ccatccgtgg	960
gccgccagca ccacgcgggc ccccatcca catcgcggcc accacgtccc tgggacacgc	1020
cttgtcccc ggtgtacgcc gagaccaagc acttcctcta ctctcaggc gacaaggagc	1080
agctgcggcc ctcttccta ctcagctctc tgaggcccag cctgactggc gctcggaggc	1140
tcgtggagac catctttctg ggttccaggc cctggatgcc agggactccc cgcaggttgc	1200
cccgctgcc ccagcgctac tggcaaagtc ggcccctgtt tctggagctg cttgggaacc	1260
acgcgcagtg ccctacggg gtgctcctca agacgcactg ccgctgcga gctgcggtca	1320
ccccagcagc cgggtgtctgt gcccgggaga agccccagg ctctgtggcg gccccgagg	1380
aggaggacac agacccccgt cgcttgggtg agctgctccg ccagcacagc agcccctggc	1440
agggtgtacg ctctgtgcgg gcctgcctgc gccggctggt gccccaggc ctctggggct	1500
ccaggcacaa cgaacgcgcg ttcctcagga acaccaagaa gttcatctcc ctggggaagc	1560
atgccaagct ctcgctgcag gagctgacgt ggaagatgag cgtgcgggac tgcgcttggc	1620
tgcgcaggag ccagggggtt ggctgtgttc cggccgcaga gcaccgtctg cgtgaggaga	1680
tcctggccaa gttcctgcac tggctgatga gtgtgtacgt cgtcgagctg ctgaggtctt	1740
tcttttatgt cacggagacc acgtttcaaa agaacaggct ctttttctac cggaagagtg	1800
tctggagcaa gttgcaaagc attggaatca gacagcactt gaagaggggtg cagctgcggg	1860
agctgtcgga agcagaggtc aggcagcatc gggaagccag gcccgccctg ctgacgtcca	1920

gactccgctt catccccaag cctgacgggc tgcggccgat tgtgaacatg gactacgtcg	1980
tgggagccag aacgttccgc agagaaaaga gggccgagcg tctcacctcg aggggtgaagg	2040
cactgttcag cgtgctcaac tacgagcggg cgcggcgccc cggcctcctg ggcgcctctg	2100
tgctgggcct ggacgatata cacagggcct ggcgcacctt cgtgctgctg gtgcggggccc	2160
aggacccgcc gcctgagctg tactttgtca aggtggatgt gacgggcgcg tacgacacca	2220
ttccccagga caggctcacg gaggtcatcg ccagcatcat caaaccccag aacacgtact	2280
gcgtgcgtcg gtatgccgtg gtccagaagg ccgcccattg gcacgtccgc aaggccttca	2340
agagccacgt ctctaccttg acagacctcc agccgtacat gcgacagtgc gtggctcacc	2400
tgcaggagac cagcccgtcg agggatgccg tcgtcatoga gcagagctcc tccctgaatg	2460
aggccagcag tggcctcttc gacgtcttcc tacgcttcat gtgccaccac gccgtgcgca	2520
tcaggggcaa gtccctacgtc cagtgccagg ggatcccgcg gggctccatc ctctccacgc	2580
tgctctgcag cctgtgctac ggcgacatgg agaacaagct gtttgccggg attcggcggg	2640
acgggctgct cctgcgtttg gtggatgatt tcttggttgg gacacctcac ctcaccacag	2700
cgaaaacctt cctcaggacc ctgggccgag gtgtccctga gtatggctgc gtggtgaact	2760
tgcggaagac agtgggtgaac ttccctgtag aagacgaggc cctgggtggc acggcttttg	2820
ttcagatgcc ggcccacggc ctattcccct ggtgcggcct gctgctggat acccggaacc	2880
tggaggtgca gagcgactac tccagctatg cccggacctc catcagagcc agtctcacct	2940
tcaaccgcgg ctccaaggct gggaggaaca tgcgtcgcaa actctttggg gtcttgccgc	3000
tgaagtgtca cagcctgttt ctggatttgc aggtgaacag cctccagacg gtgtgcacca	3060
acatctacaa gatcctcctg ctgcaggcgt acaggtttca cgcattgtgt ctgcagctcc	3120
catttcatca gcaagtttgg aagaaccca catttttctt gcgcgtcatc tctgacacgg	3180
cctccctctg ctactccatc ctgaaagcca agaacgcagg tatgtgcagg tgccctggcct	3240
cagtggcagc agtgccctgcc tgctggtggt agtgtgtcag gagactgagt gaatctgggc	3300
ttaggaagtt cttaccctt ttgcgcatcag gaagtgggtt aaccaacca ctgtcaggct	3360
cgtctgcccg ccctctcgtg gggtgagcag agcacctgat ggaagggaca ggagctgtct	3420
gggagctgcc atccttccca ccttgctctg cctggggaag cgctgggggg cctggtctct	3480
cctgtttgcc ccatgggtggg atttgggggg cctggcctct cctgtttgcc ctgtggtggg	3540
attgggctgt ctcccgcca tggcacttag ggcccttggt caaacccagg ccaagggtt	3600
aggaggaggc caggcccagg ctacccacc cctctcagga gcagaggccg cgtatcacca	3660

G1

cgacagagcc ccgcgcgcgc ctctgcttcc cagtcaccgt cctctgcccc tggacacttt	3720
gtccagcatc agggaggttt ctgatccgtc tgaaattcaa gccatgtcga acctgcggtc	3780
ctgagcttaa cagcttctac tttctgttct ttctgtgttg tggagaccct gagaaggacc	3840
ctgggagctc tgggaatttg gagtgaccaa aggtgtgccc tgtacacagg cgaggaccct	3900
gcacctggat gggggtcctt gtgggtcaaa ttggggggag gtgctgtggg agtaaaatac	3960
tgaatatatg agtttttcag ttttgaaaaa aaaaaaaaaa aaaaaaaaaa aa	4012